

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 0 987 769 A3**

(12)

## EUROPEAN PATENT APPLICATION

(88) Date of publication A3:  
07.03.2001 Bulletin 2001/10

(51) Int. Cl.<sup>7</sup>: H01L 31/0232, G02B 6/42

(43) Date of publication A2:  
22.03.2000 Bulletin 2000/12

(21) Application number: 99117965.6

(22) Date of filing: 16.09.1999

(84) Designated Contracting States:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE  
Designated Extension States:  
AL LT LV MK RO SI

(30) Priority: 18.09.1998 JP 28341698  
29.09.1998 JP 27467098

(71) Applicant:  
Sumitomo Electric Industries, Ltd.  
Osaka (JP)

(72) Inventors:  
• Nakanishi, Hiromi,  
c/o Sumitomo Electric Ind., Ltd  
Konohana-ku, Osaka (JP)  
• Kuhara, Yoshiki,  
c/o Sumitomo Electric Ind., Ltd.  
Konohana-ku, Osaka (JP)

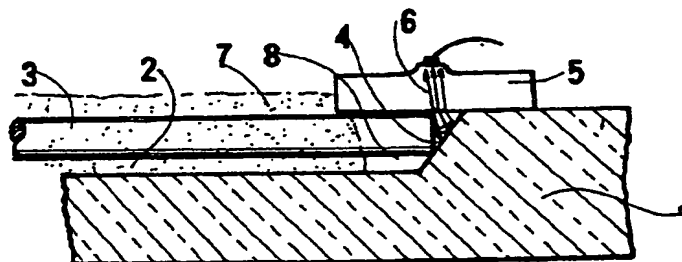
(74) Representative:  
Grünecker, Kinkeldey,  
Stockmair & Schwanhäusser  
Anwaltssozietät  
Maximilianstrasse 58  
80538 München (DE)

### (54) Photodiode module

(57) A PD module including a planar substrate, a first V-groove formed in the longitudinal direction on the substrate, a path-changing groove formed in the lateral direction vertically to the first V-groove on the substrate for ensuring a space at an extension of the first V-groove, an optical fiber fixed in the first V-groove for guiding signal light, a slanting reflection plane formed at the front wall of the path-changing groove for reflecting the light emanating from the fiber, a PD chip with a width B and a length C mounted on three spots of the substrate over the path-changing groove, the PD lying

above the path-changing groove and the slanting reflection plane, a transparent adhesive with a refractive index similar to the fiber being supplied to a space including the end of the fiber, the path-changing groove and the bottom of the PD chip, and a fixation adhesive supplied on the first V-groove and on the transparent adhesive for fixing the fiber to the first V-groove, the light emanating from the fiber being reflected by the slanting reflecting plane and being introduced into the PD chips.

Fig. 1



EP 0 987 769 A3